

**IN THE UNITED STATES DISTRICT COURT  
FOR THE NORTHERN DISTRICT OF ILLINOIS  
EASTERN DIVISION**

CARRIER VIBRATING  
EQUIPMENT, INC.

Plaintiff,

v.

GENERAL KINEMATICS  
CORPORATION,

Defendant.

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Case No. 10-cv-5110

Judge Robert M. Dow, Jr.

**MEMORANDUM OPINION AND ORDER**

Plaintiff Carrier Vibrating Equipment (“Carrier”) sued Defendant General Kinematics Corporation (“Kinematics”), alleging infringement of Carrier’s U.S. Patent 7,712,513 (“the ’513 patent”). General Kinematics counter-claimed asserting, among other things, that claims 1-4 and 27-30 of the ’513 patent are invalid under 35 U.S.C. § 102(b) because Carrier offered for sale a system for performing the claimed method more than one year before April 4, 2006, the date on which the ’513 patent application was filed. Before the Court are the parties’ cross motions for summary judgment of invalidity on that issue [75, 78]. For the reasons set forth below, the Court concludes that the prior sale does not invalidate the claims at issue here. It therefore grants Carrier’s motion [78] and denies General Kinematics’ motion [75].

**I. Background<sup>1</sup>**

**A. The ’513 Patent and the Prior Art**

The technology in this case involves a method for controlling the retention time of a casting on a vibratory conveyor, typically used in an industrial environment such as a foundry or

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<sup>1</sup> The Court takes the facts primarily from the parties’ Local Rule 56.1 statements of undisputed material facts, and from the parties’ presentations at the claim construction hearing and technology tutorial held on March 26, 2012.

other molding facility. When used in the foundry process, these vibratory conveyors, known as “shakeouts,” are used to shake sand or other surrounding mold media used in the casting process from the metal casting itself. The ’513 patent, entitled “System and Method for Controlling Casting Shakeout Retention,” discloses a system and method for controlling the retention time – the time that a casting is retained in its mold – of a casting being transported on a vibratory conveyor. This is accomplished first by imparting a vibratory force to the conveyor at a predetermined angle to the conveying surface whereby the predetermined angle determines the retention time, and then by modifying that angle. The ’513 patent was issued on May 11, 2010, based upon a patent application filed on April 4, 2006. The named inventor of the ’513 patent is Charles Mitchell, a fifteen-year employee of Carrier and currently Carrier’s Foundry Sales Manager.

At issue here are claims 1-4 and 27-30 of the ’513 patent. Independent claims 1, 27, and 30 all disclose a “providing” step, an “imparting” step, and a “modifying” step. Claim 1 is representative:

1. A method for controlling the retention time of a casting retained in a mold being transported on a conveyor comprising:

providing a vibratory shakeout conveyor having a conveying surface;

imparting a vibratory force to said conveyor at a predetermined angle to said conveying surface whereby the predetermined angle determines the retention time of said casting in said mold; and

modifying the predetermined angle of the vibratory force applied to said conveyor with respect to said conveying surface to modify the retention time of said casting in said mold.

'513 patent col. 5 ll. 63-67-col. 6 ll. 1-8.<sup>2</sup> Claims 2-4 depend from claim 1, and claims 28-29 depend from claim 27. Claims 31 and 32, which depend from claim 30, are the subject of a separate motion for summary judgment.

A vibratory conveyor like the one disclosed in the '513 patent is a fixed-length conveyor with no conveyor belt. The trough of the conveyor shakes and vibrates as it moves articles down the conveyor. To do so, vibration is imparted to the trough by eccentric weights attached to shafts rotated by electric motors. Such a vibratory conveyor can be used to dry articles like encapsulated pills, which would stick to a conveyor belt if they were not being bounced and circulated as they moved down the conveyor or, as in the case of the invention disclosed in the '513 patent, to shake sand or other mold media from a casting. The trough described in the '513 patent has holes, which allow the sand or other mold media to fall through the trough to be reclaimed and used again in the molding process.

Because vibratory conveyors are of a fixed length, the retention time of the article on the conveyor is important. The casting must remain on the conveyor long enough to complete the desired task. For example, in a foundry, longer casting retention times are typically required for more complete media removal, whereas short retention times are desirable for more fragile castings. The retention time on a fixed-length vibratory conveyor is determined by the length of the conveyor, divided by the speed of conveyance. The speed of conveyance, in turn, is dependent on the "angle of attack," which itself is a function of the relative position, or "phase angle relationship," of the eccentric weights on the rotating shafts. A more horizontal angle imparted to the conveyor trough speeds the casting down the conveyor, while a more vertical

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<sup>2</sup> Although otherwise substantially similar to claim 1, claim 27 discloses "[a] method for controlling the retention time of a casting being transported on a conveyor" ('513 patent col. 8 ll. 36-37), and "[a] method for controlling the retention time of a casting position on a conveyor" (*id.* col. 8 ll. 63-64).

angle keeps the casting in one position, resulting in a longer time for the vibration to complete its task.

Since 1991, conveyors have been capable of multiple angles of attack based on changing the phase angle relationship between eccentric weights. See U.S. Patent 5,064,053. However, in these early vibratory conveyors, the operator was required to turn off the machine and manually change the angle to change the angle of attack, and thus the retention time of the article on the conveyor. In 1997, U.S. Patent 5,615,763 (“the ’763 patent”), also owned by Carrier and discussed and incorporated by reference in the ’513 patent, changed that, allowing the operator to manually and electronically adjust the phase angle relationship “on the fly,” without shutting down the vibratory conveyor. By 2005, Carrier was making and selling in the United States vibratory conveyors equipped in accordance with the ’763 patent, such that the angle of attack could be maintained or modified electronically during operation by changing the relative phase angle relationship between the eccentric weights. To do so, the operator would monitor the progress of the article on the conveyor, and then manually modify the angle of attack with the push of a button. With a keypad, the operator could either choose a preset angle of attack, or manually input a new angle within certain limits. See Horton Decl., Ex. 3 at 15. Carrier marketed a control system for its vibratory conveyors under the trademark “Delta Phase Drive.”

The ’763 patent, however, did not disclose the use of its system “in the harsh industrial environment of a foundry or other molding facility.” ’513 patent col. 2 ll. 12-13. Nor were prior art vibratory systems, including the Delta Phase Drive, capable of monitoring an article being conveyed and adjusting the speed and direction of conveyance by modifying the angle of attack imparted on the conveyor automatically – that is, without manual operator input. ’513 patent col. 1 ll. 47-50. The invention disclosed in the ’513 patent sought to improve upon the prior art by

providing a system and method for controlling the retention time of an article on a vibratory shakeout conveyor used in a foundry “that modifies the angle of the vibratory force imparted to the conveyor as a function of the desired retention time or alternatively, as a function of article position on the conveyor or another sensed variable that is indicative of article progress.” *Id.* col. 2 ll. 23-29.

#### **B. Offer for Sale to Ross Sand Casting**

During the first half of March of 2005,<sup>3</sup> more than one year before the '513 patent application was filed, Carrier offered to sell to Ross Sand Casting a vibratory shakeout conveyor for use in a foundry that would use the Delta Phase Drive as patented in the '763 patent. The shakeout conveyor offered and sold to Ross Sand Casting was Carrier's first shakeout equipped with a Delta Phase Drive, and the first use of the Delta Phase Drive in a foundry. Carrier's proposal was a “formal quotation for the \* \* \* subject shakeout to be installed at Ross Sand Casting” with the option of being operated using the “Patented Delta-Phase drive.” Horton Decl., Ex. 5 at 4. As described in Carrier's quote to Ross Sand Casting, “Patented Delta-Phase® drive is provided to change the vibration angle automatically. This option increases shakeout efficiency by having the ability to change the retention time automatically when various products are now on the same machine. Changing the angle of vibration is a simple push of a button and does not require shutting the equipment down.”

On March 4, 2005, Carrier sent to Ross Sand Casting for approval engineering drawings of the proposed shakeout conveyor. Ross Sand Casting approved the engineering drawings on March 9, 2005. As approved, the drawings show that the proposed shakeout conveyor would

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<sup>3</sup> The quote uses two different dates, March 4, 2005, and March 14, 2005. Mitchell testified at his deposition that the March 4, 2005 date was a typo because Carrier “would have assigned the serial number after the purchase order.” Theuerkauf Decl., Ex. G at 105:14-19. The parties agree that either date is before the critical date for on-sale bar purposes, April 4, 2005.

have: (1) a conveying surface; (2) two separate, motor-driven shafts that are counter-rotating and fitted with corresponding eccentric weights; and (3) the ability to manually change the angle of attack without shutting down the machine. On March 7, 2005, Ross Sand Casting sent Carrier a purchase order for the shakeout conveyor and Delta Phase Drive control panel.

One of the conditions of the sale of the vibratory shakeout conveyor was that it was to be displayed at the Cast Expo Foundry Show held in St. Louis from April 16-20, 2005. At the show, Mitchell and others demonstrated the Delta Phase Drive as disclosed in the '763 patent. The vibratory shakeout conveyor that was demonstrated at the foundry show was shipped to Ross Sand Casting on May 12, 2005, and installed during the weekend of May 14-15.

At or after the St. Louis Cast Expo show, that is, about a month after Carrier offered to sell the shakeout to Ross Sand Casting, Mitchell conceived the idea of using the output of a programmable logic control ("PLC") to automatically change the angle of attack without operator input. To do so, Mitchell and Carrier employee Fritz Klein came up with "recipes" of desired angles of attack for desired time periods, depending on the type of casting being acted upon. Around the time of installation, Klein programmed certain of these "recipes" into the vibratory shakeout conveyor at Ross Sand Casting. See Theuerkauf Decl., Ex. M (stating in an e-mail dated Wednesday, May 18, 2005, that "[a]t this point they are going to install a local PLC that will allow the operator to input which mold he is running and it will automatically change the delta phase programming. \* \* \* They don't feel like they can rely on production people to walk over and change manually throughout the day"). At that point, the Ross Sand Casting vibratory conveyor was capable of modifying the angle of attack automatically, without further input from the operator.

The parties have filed cross motions for summary judgment on the issue of whether Carrier's March 2005 offer to sell the vibratory shakeout conveyor to Ross Sand Casting renders claims 1-4 and 27-30 of the '513 patent invalid under 35 U.S.C. § 102(b).

## **II. Legal Standard**

### **A. Summary Judgment**

Summary judgment is proper if “the movant shows that there is no genuine dispute as to any material fact and the movant is entitled to judgment as a matter of law.” Fed. R. Civ. P. 56(a). On cross motions for summary judgment, the Court construes all facts and inferences “in favor of the party against whom the motion under consideration is made.” *In re United Air Lines, Inc.*, 453 F.3d 463, 468 (7th Cir. 2006) (quoting *Kort v. Diversified Collection Servs., Inc.*, 394 F.3d 530, 536 (7th Cir. 2005)); see also *Gross v. PPG Indus., Inc.*, 636 F.3d 884, 888 (7th Cir. 2011); *Foley v. City of Lafayette, Ind.*, 359 F.3d 925, 928 (7th Cir. 2004). To avoid summary judgment, the opposing party must go beyond the pleadings and “set forth specific facts showing that there is a genuine issue for trial.” *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 250 (1986) (internal quotation marks and citation omitted).

A genuine issue of material fact exists if “the evidence is such that a reasonable jury could return a verdict for the nonmoving party.” *Id.* at 248. The party seeking summary judgment has the burden of establishing the lack of any genuine issue of material fact. See *Celotex Corp. v. Catrett*, 477 U.S. 317, 323 (1986). Summary judgment is proper against “a party who fails to make a showing sufficient to establish the existence of an element essential to that party's case, and on which that party will bear the burden of proof at trial.” *Id.* at 322. The party opposing summary judgment “must do more than simply show that there is some metaphysical doubt as to the material facts.” *Matsushita Elec. Indus. Co., Ltd. v. Zenith Radio*

*Corp.*, 475 U.S. 574, 586 (1986). “The mere existence of a scintilla of evidence in support of the opposing] position will be insufficient; there must be evidence on which the jury could reasonably find for the [opposing party].” *Anderson*, 477 U.S. at 252.

“Summary judgment is as appropriate in a patent case as it is in any other case.” *C.R. Bard, Inc. v. Advanced Cardiovascular Sys., Inc.*, 911 F.2d 670, 672 (Fed. Cir. 1990). Because an issued patent is presumed valid, see 35 U.S.C. § 282, an accused infringer must prove invalidity by clear and convincing evidence. *Creative Compounds, LLC v. Starmark Labs.*, 651 F.3d 1303, 1310 (Fed. Cir. 2011) (citing *Microsoft Corp. v. i4i Ltd. P’ship*, 564 U.S. ---, 131 S. Ct. 2238, 2252 (2011) (“For nearly 30 years, the Federal Circuit has interpreted § 282 as we do today.”)). Accordingly, a party “seeking to invalidate a patent at summary judgment must submit such clear and convincing evidence of invalidity.” *Eli Lilly and Co. v. Barr Labs., Inc.*, 251 F.3d 955, 962 (Fed. Cir. 2001).

## **B. On-Sale Bar**

Section 102(b) bars issuance of a patent if the application is filed more than one year after (1) the product was the subject of a commercial offer for sale, and (2) the invention is ready for patenting. *Pfaff v. Wells Elecs., Inc.*, 525 U.S. 55, 67 (1998). To meet the commercial offer prong, “the offer must be sufficiently definite that another party could make a binding contract by simple acceptance, assuming consideration.” *Atlanta Attachment Co. v. Leggett & Platt, Inc.*, 516 F.3d 1361, 1365 (Fed. Cir. 2008). In determining whether the offer was sufficient, the Court applies general contract principles, using sources such as the Uniform Commercial Code and the Restatement of Contracts to define whether a communication or series of communications rises to the level of a commercial offer for sale. *Id.*; *Group One, Ltd. v. Hallmark Cards, Inc.*, 254 F.3d 1041, 1047 (Fed. Cir. 2001). No actual sale is required – “an attempt to sell is sufficient if



it rises to an offer upon which a contract can be made merely by accepting it.” *Atlanta Attachment Co.*, 516 F.3d at 1365. Further, an invention can be found to be ready for patenting “in at least two ways: by proof of reduction to practice before the critical date; or by proof that prior to the critical date, the inventor had prepared drawings or other descriptions of the invention that were sufficiently specific to enable a person skilled in the art to practice the invention.” *Pfaff*, 525 U.S. at 67-68. Although “the invention need not be ready for patenting at the time of the offer \* \* \*, there is no offer for sale until such time as the invention is conceived.” *August Tech. Corp. v. Camtek, Ltd.*, 655 F.3d 1278, 1289 (Fed. Cir. 2011). Whether an invention was on sale within the meaning of § 102(b) is a question of law. *Plumtree Software, Inc. v. Datamize, LLC*, 473 F.3d 1152, 1160 (Fed. Cir. 2006).

### **III. Analysis**

The determination of whether a patent claim is invalid involves a two-step process. See *Dana Corp. v. Am. Axle & Mfg., Inc.*, 279 F.3d 1372, 1376 (Fed. Cir. 2002) (stating that “a court may not invalidate the claims of a patent without construing the disputed limitations of the claims and applying them to the allegedly invalidating acts”). First, the court determines the meaning and scope of the asserted patent claims. *Oakley, Inc. v. Sunglass Hut Int’l*, 316 F.3d 1331, 1339 (Fed. Cir. 2003) (noting that the first step in assessing the validity of a patent claim “is the same claim construction implicated in an infringement analysis”). Second, the court applies the claims as construed to the asserted prior invalidating acts. *Dana Corp.*, 279 F.3d at 1375 (citation omitted) (“When the asserted basis of invalidity is a public use or on-sale bar, the court should determine ‘whether the subject of the barring activity met each of the limitations of the claim, and thus was an embodiment of the claimed invention.’”).

The parties do not dispute the material facts relating to Carrier's offer to sell the vibratory shakeout conveyor to Ross Sand Casting. They agree that Carrier's quote was a commercial offer to sell and that the offer came more than one year before the application for the '513 patent was filed. With one exception, they also agree that the system offered for sale met each of the limitations in the claims at issue here. The dispute is over the scope of claims 1-4 and 27-30 of the '513 patent.<sup>4</sup> At the time that Carrier offered the vibratory shakeout conveyor to Ross Sand Casting, it was not capable of automatically modifying the angle of vibratory force without operator input. Thus, whether the system offered for sale was an embodiment of the invention claimed in '513 depends on whether the "modifying" step is limited to an automatic modification of the initial, predetermined angle of attack, as Carrier claims, or whether it also encompasses manually changing the angle of attack as the machine operates, as General Kinematics argues. Accordingly, the Court begins with the construction of the "modifying" step disclosed in independent claims 1, 27, and 30.

#### **A. Claim Construction**

Claim construction is a legal determination to be made by the court. See *Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 391 (1996). The Federal Circuit has explained that "[t]he construction of claims is simply a way of elaborating the normally terse claim language in order to understand and explain, but not to change, the scope of the claims." *Embrex, Inc. v. Serv. Eng'g Corp.*, 216 F.3d 1343, 1347 (Fed. Cir. 2000) (internal quotations and alterations

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<sup>4</sup> Carrier also argues that the on-sale bar does not apply here because the invention disclosed in the '513 patent was conceived after the critical date. See *August Tech. Corp.*, 655 F.3d at 1289 ("[T]here is no offer for sale until such time as the invention is conceived."). Although it is undisputed that Mitchell did not conceive of the use of a PLC to automatically modify the angle of attack until after the critical date, as of the critical date he *had* conceived of the use of the invention described in the '763 patent in a foundry. Thus, if the scope of the claims at issue includes the manual modification of the angle of attack, as General Kinematics argues, at least part of the invention disclosed in the '513 patent was conceived before the critical date.

omitted). Claims must be construed through the eyes of “the person of ordinary skill in the field of the invention.” *Multiform Desiccants, Inc. v. Medzam, Ltd.*, 133 F.3d 1473, 1477 (Fed. Cir. 1998); see also *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) (“The inquiry into how a person of ordinary skill in the art understands a claim term provides an objective baseline from which to begin claim interpretation.”). With that mindset, courts “look to the intrinsic evidence, including the claim language, written description, and prosecution history, as well as to extrinsic evidence” in construing claims. *TIP Sys., LLC v. Phillips & Brooks/Gladwin, Inc.*, 529 F.3d 1364, 1369 (Fed. Cir. 2008).

The Federal Circuit has directed courts to “look first to the intrinsic evidence of record, *i.e.*, the patent itself, including the claims, the specification and, if in evidence, the prosecution history.” *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996). The analysis begins with the words of the claims themselves, which are generally given their ordinary and customary meaning. *Id.* “[T]he ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention.” *Phillips*, 415 F.3d at 1313.

The “‘heavy presumption’ in favor of the ordinary meaning of claim language \* \* \* is overcome \* \* \* where the patentee has chosen to be his own lexicographer.” *Bell Atl. Network Servs., Inc. v. Covad Commc’ns Group, Inc.*, 262 F.3d 1258, 1286 (Fed. Cir. 2001). A patentee acts as his own lexicographer if he “‘clearly set[s] forth a definition of the disputed claim term’ other than its plain and ordinary meaning.” *Thorner v. Sony Computer Entm’t Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012) (quoting *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002)). The presumption in favor of the ordinary meaning is overcome only where the “special definition of the term is clearly stated in the patent specification or file

history.” *Vitronics*, 90 F.3d at 1582; *Phillips*, 415 F.3d at 1316 (“inventor’s lexicography governs \* \* \* [where] the specification \* \* \* reveal[s] a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess”); *In re Paulsen*, 30 F.3d 1475, 1480-81 (Fed. Cir. 1994) (where inventor seeks to “define the specific terms used to describe his or her invention, this must be done with reasonable clarity, deliberateness, and precision”). Even where the patentee acts as his own lexicographer, the court’s focus remains on determining how a person of ordinary skill in the art would understand the claim terms. Thus, “the inventor’s lexicography \* \* \* must be understood and interpreted by the court as they would be understood and interpreted by a person in that field of technology.” *Multiform Desiccants, Inc.*, 133 F.3d at 1477.

The second place to which a court looks in construing claims is the specification, in part to determine whether the inventor has redefined any claim terms. *Vitronics*, 90 F.3d at 1582. The Federal Circuit has explained that, because claims “are part of ‘a fully integrated written instrument,’ \* \* \* [they] ‘must be read in view of the specification[] of which they are a part.’” *Phillips*, 415 F.3d at 1315 (quoting *Markman*, 52 F.3d at 978-79). Therefore, “the specification is always highly relevant to the claim construction analysis.” *Vitronics*, 90 F.3d at 1582. Indeed, the Federal Circuit has advised that the specification “is the single best guide to the meaning of a disputed term,” and, therefore, “[u]sually, it is dispositive.” *Id.*

Nevertheless, while “the claim language must be examined in light of the written description,” the Federal Circuit repeatedly has admonished courts not to read “limitations \* \* \* into the claims from the written description.” *Prima Tek II, L.L.C. v. Polypap, S.A.R.L.*, 318 F.3d 1143, 1148 (Fed. Cir. 2003). In the same vein, the Federal Circuit “has cautioned against limiting the claimed invention to preferred embodiments or specific examples in the

specification.” *Texas Instruments, Inc. v. United States Int’l Trade Comm’n*, 805 F.2d 1558, 1563 (Fed. Cir. 1986). The line between reading a claim in light of the specification, and reading limitations into the claim from the specification is a fine one. *Comark Commc’ns, Inc. v. Harris Corp.*, 156 F.3d 1182, 1186 (Fed. Cir. 1998). To “discern [that line] with reasonable certainty and predictability[,] \* \* \* the court’s focus [must] remain[] on understanding how a person of ordinary skill in the art would understand the claim terms.” *Phillips*, 415 F.3d at 1323.

The third type of intrinsic evidence the court may consider is the prosecution history. *Phillips*, 415 F.3d at 1323.

If, after reviewing the intrinsic evidence, ambiguity remains regarding the meaning of disputed claim terms, the court may consider extrinsic evidence, including dictionaries, treatises, and expert testimony. *Phillips*, 415 F.3d at 1317; see also *Vitronics*, 90 F.3d at 1584 (“[o]nly if there [is] still some genuine ambiguity in the claims, after consideration of all available intrinsic evidence, should the trial court \* \* \* resort[] to extrinsic evidence”). However, extrinsic evidence generally is considered to be “less reliable” than intrinsic evidence and “unlikely to result in a reliable interpretation of patent claim scope unless considered in the context of the intrinsic evidence.” *Phillips*, 415 F.3d at 1318-19.

Claims 1, 27, and 30 each contain a step directed to modifying the angle of attack to change the retention time of the casting on a vibratory conveyor. Claim 1 is representative:

1. A method for controlling the retention time of a casting retained in a mold being transported on a conveyor comprising:

providing a vibratory shakeout conveyor having a conveying surface;

imparting a vibratory force to said conveyor at a predetermined angle to said conveying surface whereby the predetermined angle determines the retention time of said casting in said mold; and

**modifying** the predetermined angle of the vibratory force applied to said conveyor with respect to said conveying surface to modify the retention time of said casting in said mold.

'513 patent col. 5 ll. 63-67-col. 6 ll. 1-8 (emphasis added). The parties agree that a person of ordinary skill in the art would read the claim term itself as broad enough to include both automatic modification *and* manual modification of the predetermined angle of the vibratory force. The question is whether the specification limits the scope of the term to automatic modification of the angle of attack. The Court concludes that it does.

From the beginning of the specification of the '513 patent, "it is clear that [Mitchell's] primary basis for distinguishing [his] invention" from that of the prior art was its ability to modify the angle of attack, and therefore the retention time, automatically, without any manual operator input. See *Ormco Corp. v. Align Tech., Inc.*, 498 F.3d 1307, 1313 (Fed. Cir. 2007) (interpreting the claims to require automatic determination because, among other reasons, "[f]rom the beginning of the common specification \* \* \*, it is clear that the inventors' primary basis for distinguishing their invention was its high level of automation \* \* \* as compared to the prior art"). The specification states that prior art vibratory conveyor systems, including the '763 patent, were "incapable of monitoring an article being conveyed to adjust the speed and direction of conveyance to impart a desired amount of vibratory force to an article before its discharge from the conveyor." '513 patent col. 1 ll. 47-50. The invention disclosed in the '513 patent provided a solution to that problem: "an electronically adjustable system for controlling conveyor retention time that permits an article being conveyed to be monitored such that a desired result is achieved prior to the article being discharged from said conveyor." *Id.* col. 2 ll. 29-33. These teachings – about the problems solved by the claimed invention, the way the claimed invention solves those problems, and how the prior art relates to the invention – all

“provide valuable context for the meaning of the claim language.” See *Eastman Kodak Co. v. Goodyear Tire & Rubber Co.*, 114 F.3d 1547, 1554 (Fed. Cir. 1997) (abrogating on other grounds by *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1456 (Fed. Cir. 1998)).

The Detailed Description then describes “a preferred construction embodiment of the invention” as follows. ’513 patent, col. 3 ll. 13-14. An operator inputs an initial, predetermined angle into “[a] manually operated user input 72.” *Id.* col. 3 l. 64. User input 72 then sends the desired signal to controller 70, which sends an output signal 73 to a variable frequency drive 80, which by changing the relative phase angle between shafts, imparts a predetermined angle,  $\Theta_1$ , onto the conveyor, advancing the article on the conveyor. This is the “imparting” step. Controller 70 then operates without any further manual input to electronically adjust and effect change in the vibration angle which modifies the retention time of an article on the conveyor. At a predetermined position, “controller 70 increases the resultant angle of vibration to  $\Theta_2$ ” (*id.* col. 4 ll. 42-43), slowing the article down and allowing for further breakdown of mold media. Then, controller 70 decreases the “resultant angle of vibration” to  $\Theta_3$ , “to effect the advancement and discharge of” the casting from the conveyor. *Id.* col. 4 ll. 49-51. The change from  $\Theta_1$  to  $\Theta_2$ , and from  $\Theta_2$  to  $\Theta_3$  is the “modifying” step.

The phrase “input by an operator” or “manually operated” appears only twice in the ’513 patent. See *id.* col. 2 ll. 43-44; *id.* col. 3 ll. 64. In both cases, the context shows that this manual activity is in the initial set-up of the system, and is not related to manually modifying the angle of vibratory force while the conveyor is running. First, the Summary of the Invention describes the invention as:

[A] vibratory shakeout conveyor that may utilize an electronic control system to modify the relative angle of the vibratory force applied to the conveying surface responsive to a desired retention time, either as **input by an operator** or responsive to a sensed variable such as casting position or media removal.

*Id.* col. 2 ll. 39-45 (emphasis added). General Kinematics asserts that the phrase “input by an operator” in this paragraph demonstrates that the “relative angle of the vibratory force” may be modified with either “input by an operator” (manually), or “responsive to a sensed variable” (automatically). The Court agrees with Carrier, however, that “input by an operator” here refers to “desired retention time,” not the “relative angle of the vibratory force,” and that the ’513 patent makes clear that the “electronic control system” is what is used to modify the “relative angle of the vibratory force.” The phrase “either as input by an operator or responsive to a sensed variable” is acknowledging two of the embodiments disclosed in the ’513 patent. The angle of attack may be modified automatically based on either (1) a predetermined time period selected by the operator and manually inputted into user input 72 at the same time that the operator manually selects the initial angle of attack, or (2) a sensor that detects the absence of mold media on the casting and sends a signal to controller 70 when the casting is ready to be discharged from the conveyor. See *id.* col. 5 ll. 4-27. In either case, it is the “electronic control system” that is automatically modifying the relative angle of the vibratory force. Likewise, the phrase “[a] manually operated user input 72” involves manual input from the operator, but that input is complete once the casting starts moving – it is never done while the machine is operating to modify the angle of attack. *Id.* col. 3 ll. 64.

That the “modifying” step is done automatically by controller 70 without any additional manual input from user input 72 is confirmed in the drawing figures. Each is a block diagram of a vibratory conveyor and control system in accordance with “one embodiment of the present invention.” See, *e.g.*, *id.* col. 2 ll. 66-67. Figure 1 includes a depiction of user input 72, and output signal 73 from controller 70, which feeds variable frequency drive 80. Figures 2-4 of the ’513 patent do not include user input 72, but do depict a controller and a variable frequency



drive. Figures 2-4 depict the position of a casting on a conveyor in three different locations on the conveyor, corresponding to three different angles of attack,  $\Theta_1$ ,  $\Theta_2$ , and  $\Theta_3$ .

General Kinematics disagrees with the reading of the figures set forth above. It argues that Figures 1 and Figures 2-4 represent two alternative embodiments of the invention disclosed in the '513 patent – one in which the operator manually imparts and modifies the angle of attack (Figure 1), and one in which controller 70 automatically modifies the angle of attack, without any input from the operator. Setting aside the fact that Figures 2-4 show no user input at all, not even during the initial imparting step, the specification does not support General Kinematics' argument. It is true that the Brief Description of the Drawing Figures describes each as being “in accordance with one embodiment of the present invention.” *Id.* col. 2 ll. 65-67-col. 3 ll. 1-9. But taken in context, it is clear that all four figures depict the same embodiment – “one embodiment” – not alternative embodiments, as General Kinematics argues. The specification does disclose “a plurality of embodiments to the present invention,” but those embodiments differ in how controller 70 knows when to alter the angle of attack, not in whether the angle is altered manually or automatically. *Id.* col. 4 ll. 53-55 (“The requisite changes to the resultant angle of vibration  $\Theta$  \* \* \* may be effected by a plurality of embodiments to the present invention.”).

The Court's conclusion that the specification limits the “modifying” step to automatic modification of the angle of attack also comports with the use of the term “modifying” in other claims in the '513 patent. “Because claim terms are normally used consistently throughout the patent, the usage of a term in one claim can often illuminate the meaning of the same term in other claims.” *Phillips*, 415 F.3d at 1314. Independent claims 5 and 6 each recites an “imparting,” a “monitoring,” and a “modifying” step. General Kinematics does not dispute that the monitoring and modifying steps in these claims are performed automatically. See Def's.

Reply at 12. Indeed, the specification teaches that the modifying step in these two claims is accomplished based on the output of the sensor 74, which detects the absence of media on the casting without any operator input, and then sends a signal to controller 70. Although claim terms may be construed differently throughout the patent if “it is clear from the specification and prosecution history that the terms have different meanings at different portions of the claims,” *PODS, Inc. v. Porta Stor, Inc.*, 484 F.3d 1359, 1366 (Fed. Cir. 2007), nothing in the specification indicates that the “modifying” step should be construed differently in claims 1, 27, and 30 than in claims 5-6.

Likewise, the Court’s construction avoids an interpretation that could ensnare the prior art. If modification of the angle of attack can be done manually with the push of a button, claims 27-30, which are not directed to use with a shakeout conveyor (the “new use” that General Kinematics contends sets the ’513 patent apart from the ’763 patent), would read on the process disclosed in the ’763 patent. Where possible, “claims should be read in a way that avoids ensnaring prior art \* \* \*.” *Apple Computer, Inc. v. Articulate Sys., Inc.*, 243 F.3d 14, 24 (Fed. Cir. 2000) (quoting *Eastman Kodak Co.*, 114 F.3d at 1556).<sup>5</sup>

In sum, for the reasons outlined above, the Court concludes that the specification limits the term “modifying” to automatic modification of the angle of vibratory force. “Where the

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<sup>5</sup> During the claim construction hearing and tutorial held on March 26, 2012, General Kinematics argued that the claim language of U.S. Patent 8,096,406 (“the ’406 patent”) supports its position. The ’406 patent, which issued in January of 2012, is a divisional patent and shares the same specification as the ’513 patent. Instead of simply using the term “modifying,” like the ’513 does in certain of its claims, the ’406 patent as issued uses the term “automatically modifying.” General Kinematics’ point that construing the term “automatically modifying” to mean “automatically automatically modifying” would be redundant is well taken. But the Court here is interpreting the terms of the ’513 patent, not the terms of the ’406 patent, which issued later. What happened after the ’513 patent issued, even with a divisional patent, is not part of the prosecution history of the ’513 patent. See *Elkay Manufacturing Co. v. Ebco Manufacturing Co.*, 192 F.3d 973, 980 (Fed. Cir. 1999) (“When multiple patents derive from the same initial application, the prosecution history regarding a claim limitation in any patent that has issued applies with equal force to *subsequently issued patents* that contain the same claim limitation.”) (emphasis added).

specification makes clear that the invention does not include a particular feature, that feature is deemed to be outside the reach of the claims of the patent, even though the language of the claims, read without reference to the specification, might be considered broad enough to encompass the feature in question.” *SciMed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc.*, 242 F.3d 1337, 1341 (Fed. Cir. 2001). The “modifying” step in independent claims 1, 27, and 30 thus reads as follows (claim 1 is representative):

1. A method for controlling the retention time of a casting retained in a mold being transported on a conveyor comprising:

providing a vibratory shakeout conveyor having a conveying surface;

imparting a vibratory force to said conveyor at a predetermined angle to said conveying surface whereby the predetermined angle determines the retention time of said casting in said mold; and

**[automatically] modifying** the predetermined angle of the vibratory force applied to said conveyor with respect to said conveying surface to modify the retention time of said casting in said mold.

’513 patent col. 5 ll. 63-67-col. 6 ll. 1-8 (emphasis added). Because this issue is dispositive, the Court declines to construe the term “casting retained in a mold,” found in claims 1-4.

## **B. Application to the System Offered for Sale**

As noted above, the parties agree that the vibratory shakeout conveyor offered to Ross Sand Casting was not capable of modifying the angle of vibratory force without operator input. Because the Court has concluded that the specification limits the “modifying” step to the automatic modification of the angle of vibratory force, the vibratory shakeout conveyor offered for sale does not read on each of the limitations of claims 1-4 and 27-30 of the ’513 patent. For that reason, the Court grants Carrier’s motion for summary judgment of non-invalidity of claims 1-4 and 27-30 [78] and denies General Kinematics motion for summary judgment of invalidity of those same claims [75].

#### **IV. Conclusion**

For the foregoing reasons, the Court construes the “modifying” step in independent claims 1, 27, and 30 of the ’513 patent to mean “automatically modifying.” Based on this interpretation, the Court grants Carrier’s motion for summary judgment of non-invalidity of claims 1-4 and 27-30 of the ’513 patent [78] and denies General Kinematics motion for summary judgment of invalidity of those same claims [75].

A handwritten signature in black ink, appearing to read "Robert M. Dow, Jr.", with a stylized flourish at the end.

Dated: September 27, 2012

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Robert M. Dow, Jr.  
United States District Judge